

Re: Review of desk top coal mining Information & drilling results at 102 Earlstone Crescent, Cadbury Heath, Bristol BS530 5AD

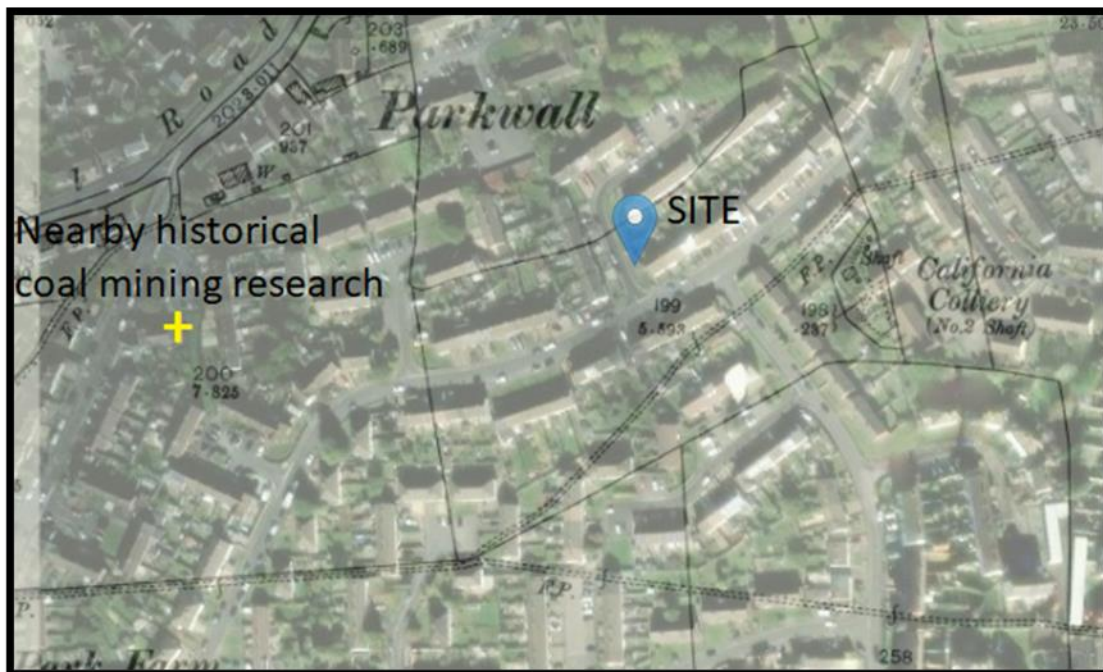
The following comments are made in respect of a review of Earth Environmental's earlier CMRA Report No B2280/22, March 2022, Geoinvestigate's drilling investigation report G22352, Feb 2023 & Coal Authority comments from Peter Woodcock of 3 May 2023 on the drilling investigation. The CA comments are attached.

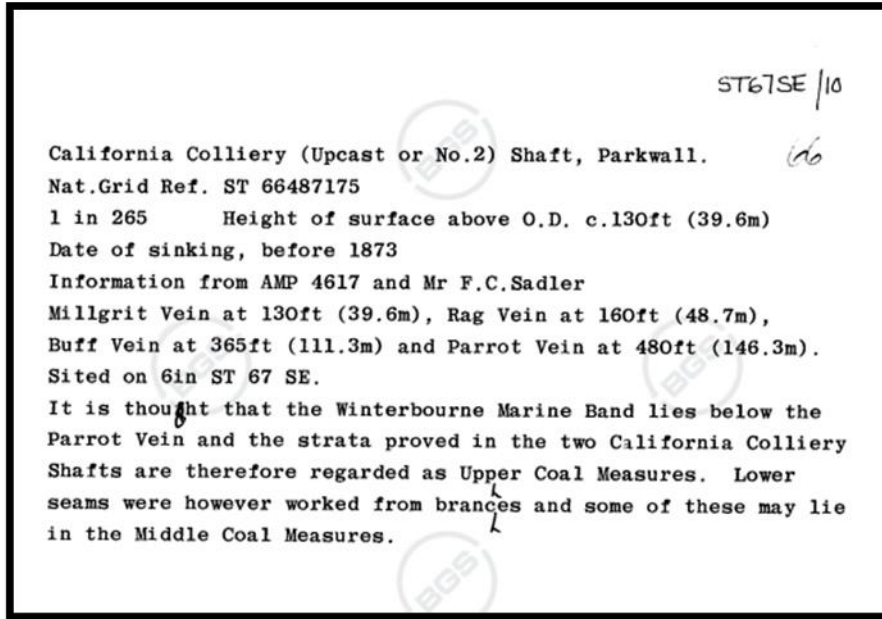
The main concern of the CA regarding the drilling report is their records show the Millgrit and Rag coal seams have been worked at shallow depth beneath the site with extraction thicknesses of 200cm and 150m cm respectively however this matter is not addressed in the report.

Desk Top Review

The 2022 CMRA suggests the approximate depth to the 4 coal seams Millgrit, Rag, Buff and Parrot beneath the site is 0m, 12m, 140m and 230m respectively. In Geoinvestigate's opinion this information is incorrect. The CMRA relied upon a basic CON29M coal mining report suited more to the house conveyancing and property markets rather than specialist CMRA reporting whereas some planning authorities insist upon a 'Consultants Coal Mining Report'.

Historic BGS log ST67/10 of nearby California Colliery (Upcast or No 2) Shaft, Parkwall records the depths of the 4 seams at 39.6m, 48.7, 111.3 & 146.3m respectively.

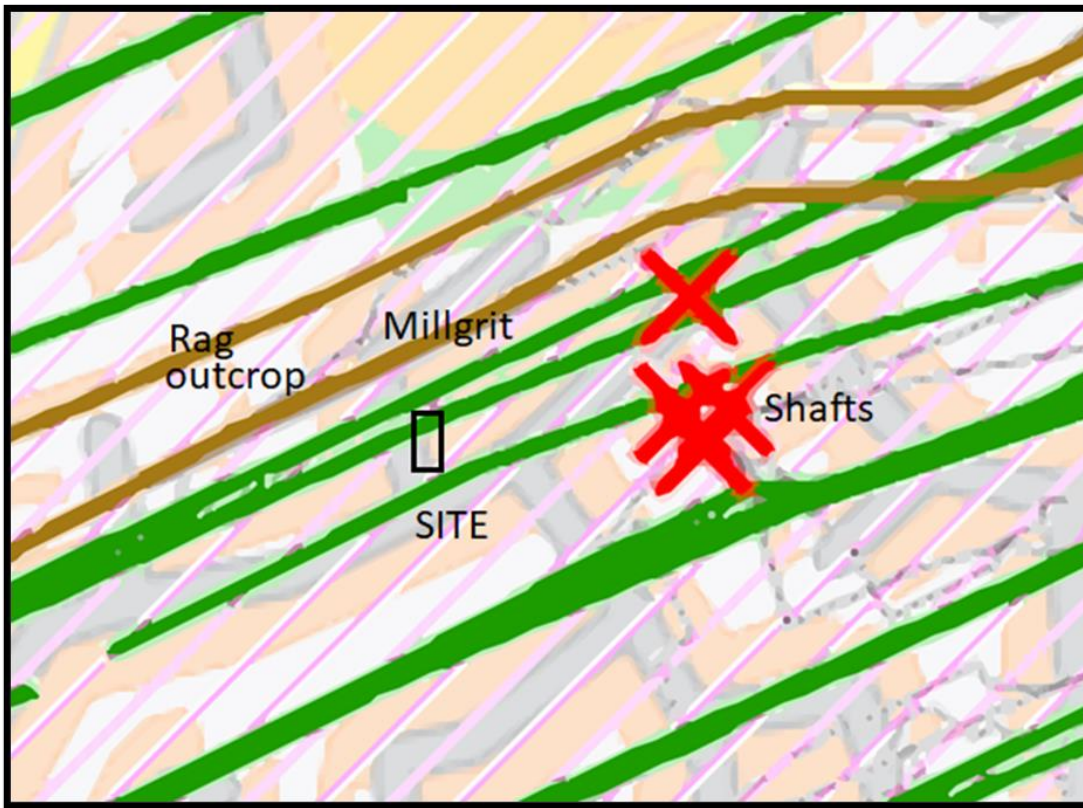




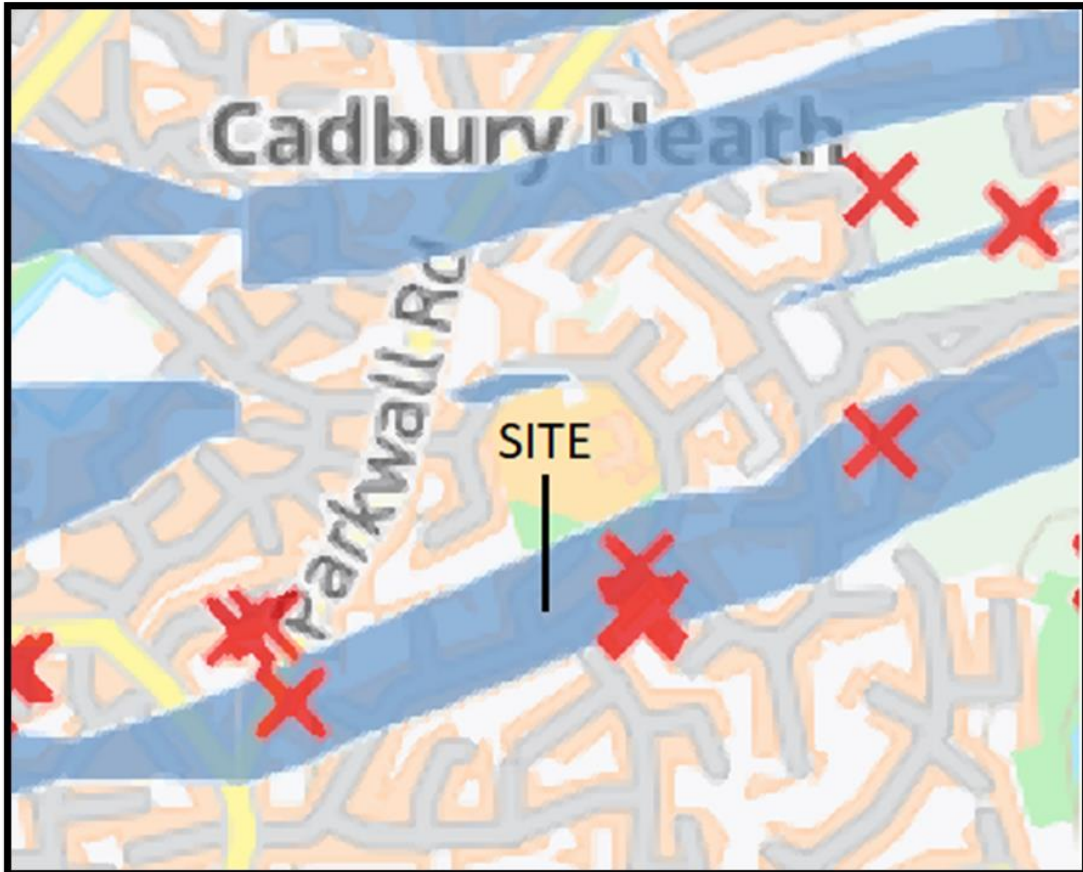
Ground level at the development site is 46m aOD and similarly currently around 46m at the housing estate today occupying California Colliery but may have been several metres higher at the colliery when the log was made as the shaft is shown located on a raised mound or spoil heap. However, the shaft position is uncertain and the CA & BGS show 4 slightly different locations for it.

Ground level at the shaft is incorrectly estimated on the log at around 130ft aOD when it is actually 150ft/46m but was perhaps higher at say 48m aOD at shaft collar on the mound which is no longer present. This places the Millgrit and Rag at 8.4m and minus (-) 0.7m aOD in the shaft or 2m lower if no mound was ever present beneath the shaft with 9.1m separation between the seams in the shaft.

The extract of CA online interactive mapping shown below, provides useful information on coal outcrop, coal seam level contours and underground workings at the site locality. According to this information the site is underlain within shallow depth by mine working panels 3C8C, seam code BR090I and panel 3708, seam code BR99I corresponding with outcrops and workings of the Rag and Millgrit Coals the latter dipping 18.7° to direction 154° and whose outcrop is shown lying some 40m to the north of the property. California Colliery's shafts are shown to the east of the site on the extract.



Past shallow working in the Rag and Millgrit coal seams at the site locality shown BLUE on the CA plan extract below.



Projecting shaft No 2's log information up dip at 18.7 degs from California Pit some 40m or 50m north of a strike line drawn through the shaft position/s places the Millgrit Coal horizon at a depth of 22.6m or 24m below the new building extension at 102 Earlstone Crescent, the Rag Coal at 31.7 or 33.1m, the Buff at 94m and the Parrot Coal at 129m.

Geoinvestigate's analysis suggests the Millgrit Coal outcrop occurs further north than that indicated by the CA an observation also made in a recent nearby historical coal mining review by others. Our analysis also shows that the Millgrit and Rag seams do not occur at 0m and 12m depth beneath the new building but rather 23m and 32.5m respectively.

Subsequently the mining abandonment plans for nearby California Colliery Pit show slightly different depths for the Millgrit and Rag Coal seams in the shaft and lesser separation between these two coal horizons.

Useful historical coal mining research by local expert coal mining historians Bristol Mining Archives (BMA) is available online via the following link.

<https://planning.org.uk/docs/20210120/15/QN4SEYOKKWO00/nkuvzbw865swfcu4.pdf>

This research including discussion of the Millgrit and Rag Coals, California Colliery No 2 Shaft and local mine working methods is focussed on a nearby site to the west of 102 Earlstone Crescent.

In a 1996 House of Commons sitting then local MP Roger Berry (Kingswood) suggested that BMA were perhaps the leading local historical source on the complexities of the coal mining history of the

Bristol Coalfield and indeed Geoinvestigate is impressed in this instance by the high quality of their research.

<https://api.parliament.uk/historic-hansard/commons/1996/nov/25/former-mine-shafts-kingswood>

The pertinent information to be drawn from BMA's nearby research regarding the expected coal mining geology below 102 Earlstone Crescent is as follow: -

- Millgrit Vein on average 5ft (1.5m) thick up to 1.8m. Sometimes parted into 2 seams.
- Rag Vein on average 3ft (0.9m) thick
- Devils, Dibble or Black Vein generally worthless, about 1ft (0.3m) thick
- Buff Vein, variable, but usually 3ft (0.9m)
- Parrot Vein variable but normally about 2ft (0.6m) thick

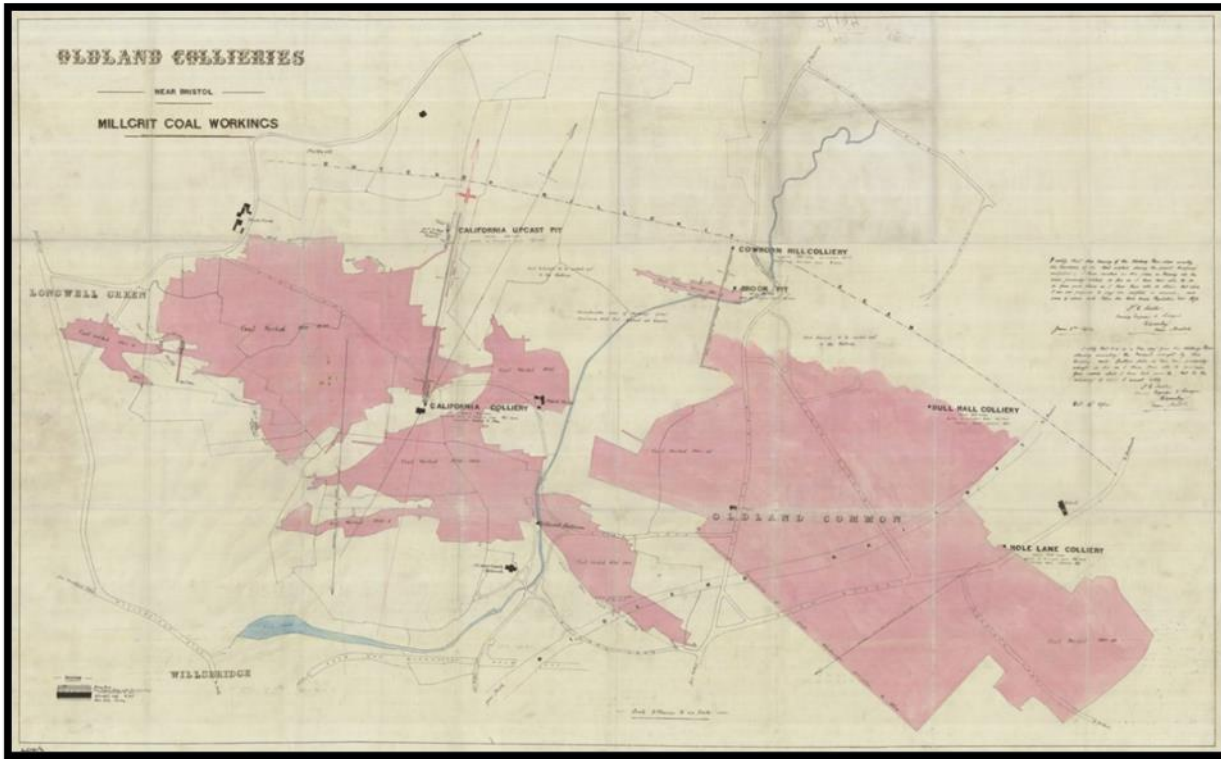
Reviewing the mine plans of the workings in the Millgrit Vein to the west of California No 2 Shaft BMA's research concluded the Millgrit Vein at this western locality was around 3ft 6in thick (1.1m) and the Rag Coal below it was worked quite extensively.

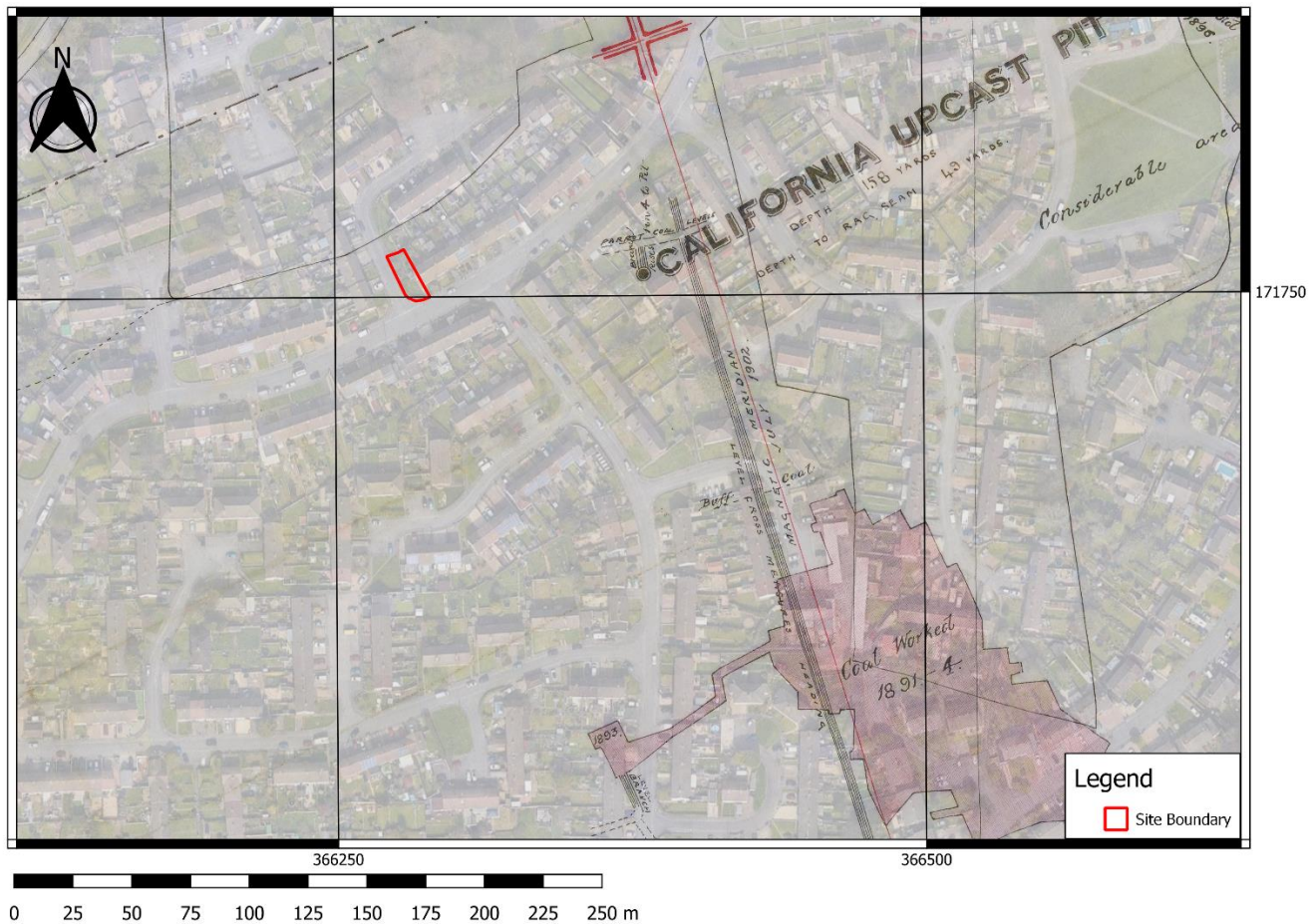
Regarding underground working methods this research speculates that extraction was done by a method known as 'Topple and Dukeway' a variation of longwall working. With this type of mining, it was possible to remove most of the coal at almost any angle of dip, the ground then being allowed to subside. According to this research this is probably the method employed at the Peg House Pit to the east in its first phase of working, before it was reopened as the California No.2 shaft. Generally, settlement occurred in such cases as soon as support was removed, and at the depths concerned, void migration to the surface is not a risk factor so long after abandonment.

According to BMA's research pillar and stall, used extensively elsewhere in the country, was rarely used here.

Mine Abandonment Plans

The mining abandonment plans for the Millgrit and Rag Coal workings were subsequently purchased from the CA. Both plans provide information on seam thickness and have been georeferenced by Geoinvestigate in the vicinity of the site and the California Upcast Pit.





Both plans show little information on the mining method in the older workings in the Millgrit and Rag seams beneath the site and in the vicinity of California Upcast Pit. The depth to the Millgrit in the Upcast Shaft is 42 yards/38.4m and the Rag 49 yards/44.8m with separation of 6.4m between the two rather than 9.1m.

Projection of the shaft information up-dip at 18.7 degs places the Millgrit and Rag horizon at depths of 23.5m and 29.9m at the position of borehole RH1 within the site and at depths of 20.1m and 26.5m at the far north end of the plot.

The outcrops of both the seams lie further north than shown by the CA's online mapping. The abandonment plans state that both coal seams are believed to have been worked out to the outcrop.

An area of older Millgrit coal pillars was worked in 1902 - 1903 from Brook Pit to the east of the site and the California Upcast Pit suggesting that a small area of the Millgrit seam was worked by pillar and stall. The absence of references to pillar extraction elsewhere including the site perhaps suggest that by far the larger area of this seam was extracted by the longwall method.

Both plans provide coal seam thicknesses - 1.83m for the Millgrit and 0.31 to 1.52m for the Rag.

A horizon of 'Duns' (shale) 1 to 8 feet with black partings is noted above the Millgrit Coal with 'Black Coaley Fireclay' below it.

Review of Drilling Results

Geoinvestigate's CMRA follow on drilling investigation report has been reviewed considering the findings of the desk top study review and a review of historic mining abandonment plans. A site photograph and the log of RH1 are provided below.



102 Earlstone Crescent, Bristol BS30 8AD - Rotary Hole RH1



GEOINVESTIGATE Ltd.

Your Ref.

Our Ref.

G22352

RH No.1 Sheet No. 1 of 2

Location: Land at 102 Earlstone Crescent, Cadbury Heath, Bristol BS30 8AD

DATE: 09/02/03

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
1.80	TURF / Brown and orange DRIFT.	1800							
12.7	Orange and red SANDSTONE. Becoming grey from 7.50m	10900							2.50 5.00 7.50 10.00 12.50
17.1	Light grey SILTSTONE.	4400							15.00
23.2	Grey SANDSTONE and MUDSTONE.	6100							17.50 20.00 22.50
23.8	Dark grey and black carbonaceous MUDSTONE.	600							
	Brown and grey SANDSTONE.	6200							25.00

Remarks: Casing to 2.00m
Microdrill rotary open hole borehole to 30m
No cores recovered from borehole
No gas detected from borehole on completion
Full flush returned. No voids encountered.

Key:

- Slotted Pipe
- Plain Pipe
- Bentonite
- Gravel Filter
- Disturbed sample
- Cv Shear vane
- W Water sample
- S Standard Penetration Test
- C Cone Penetration Test

RH1



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RH No.1

Sheet No. 2 of 2

Location: Land at 102 Earlstone Crescent, Cadbury Heath, Bristol BS30 8AD

DATE: 09/02/03

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
	Brown and grey SANDSTONE.	6200							27.50
30.0							Full Flush		30.00
	Rotary hole terminated at 30.00m								

It is Geoinvestigate's opinion that boreholes RH1 and RH2 reached the working level of the Millgrit Coal at 23m to 24m depth, in both holes, corresponding with the reference on both logs to "black carbonaceous mudstone" probably corresponding with the horizon of "Duns" or "Black Coaley Fireclay" noted on the Millgrit abandonment plan. No good quality coal was encountered in either hole indicating that the Millgrit seam has been removed by underground mining at both borehole locations.

The original thickness of the Millgrit Coal seam is assumed to range from 1.5m to 1.8m beneath the site perhaps reducing to 1.1m to the west of the property.

The Rag Coal lies 6.4m below the Millgrit at 30m depth placing this working horizon at or a little below the 30m termination depth of both holes perhaps explaining why no mention of it is made on the borehole logs. No mining disturbance or water loss was noted at the bottom of each borehole hole perhaps suggesting that like the Millgrit seam above workings in the Rag below have closed tight with no relict mine voids.

It is Geoinvestigate's opinion based on authoritative nearby research that working in the Millgrit Coal is likely to have closed tight soon after mining and removal of support so that ground movement has stopped by now hence no voids were encountered and full drill water flush was returned all the way down both holes without loss. Geoinvestigate has encountered similar complete mine closure at several sites elsewhere where total extraction/longwall mining had been practiced.

Given that pillar and stall working, with the potential to contain relict mine voids, is unlikely to have occurred here, therefore, also, in our opinion, is upward void migration unlikely to pose a surface ground stability hazard to surface development at 102 Earlstone Crescent. Notwithstanding the forgoing, if remnant mine voids persist today in the Millgrit working horizon beneath the site there is adequate thickness of rock cover of 20m to prevent crown hole subsidence or collapse reaching surface. Due to this favourable outcome, it is considered that mine working grouting and special mitigating foundation design is not required in this instance. This is borne out by the good performance of the adjacent terrace housing which was built in the 1950s to mid-1960s likely without such protection and the absence of coal mining subsidence claims both at the site locality and within its immediate adjacent surroundings.

Workings in the Buff and The Parrot Coals (expected at 102m and 131m depth beneath the site) lie too deep to impact surface ground stability within the development area.

While there are no reported mine gas incidents at this locality and the existing adjacent 1950/60s housing is unlikely to be fitted with gas protection, it is Geoinvestigates opinion given the presence of shallow mine working and possible nearby very shallow outcrop working to the north of the property that gas protection should as a precaution be incorporated into the design of the new building extension. The level of gas protection should be in accordance with “Characteristic Situation 2” (CS2) based upon the CIRIA 665 (revised) report – “Assessing the risks posed by hazardous ground gases to buildings”. However, agreement will be required from the Local Planning Authority for this proposal.

For and on behalf of Geoinvestigate Ltd

A handwritten signature in black ink, appearing to read 'RN', is positioned above the name of the signatory.

Ross Nicholson BSc (Hons) MSc (Eng) CEng MIMMM
Principal Mining Specialist

Encl – CA Comments – 3 May 2023



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Email: planningconsultation@coal.gov.uk

Web: www.gov.uk/coalauthority



The Coal
Authority

For the Attention of: Ben France – Case Officer
South Gloucestershire Council

[By Email: planningapps@southglos.gov.uk]

3rd May 2023

Dear Mr France

PLANNING APPLICATION: DOC23/00120

Discharge of conditions 5 (Intrusive investigations) and 6 (Signed statement of safety) attached to permission P22/01682/F. Erection of two storey side extension to form 1 no. dwelling with associated works.; Land At, 102 Earlstone Crescent, Cadbury Heath, South Gloucestershire, BS30 8AD

Thank you for your consultation notification of 12 April 2023 seeking the views of The Coal Authority on the above application.

We previously commented on the planning application to which this discharge of condition relates in a letter to the LPA dated 13th April 2022. In this letter we commented on the Coal Mining Risk Assessment, dated 16th March 2022 and prepared by Earth Environmental & Geotechnical Ltd, submitted by the applicant. Based on the conclusions of this report we recommended that relevant planning conditions were imposed on any planning permission granted.

Our interest therefore lies in Condition 5 and 6, as imposed by the grant of planning permission dated 22nd June 2022, and this requires the following:

5. No development shall commence until;

a) a scheme of intrusive investigations has been carried out on site to establish the risks posed to the development by past shallow coal mining activity; and

b) any remediation works and/or mitigation measures to address land instability arising from coal mining legacy, as may be necessary, have been implemented on site in full in order to ensure that the site is made safe and stable for the development proposed.

The intrusive site investigations and remedial works shall be carried out in accordance with authoritative UK guidance.

6. The dwellings shall not be occupied until a signed statement or declaration prepared by a suitably competent person confirming that the site is, or has been made, safe and stable for the approved development which shall be submitted to the Local Planning Authority for approval in writing. This document shall confirm the methods and findings of the intrusive site investigations and the completion of any remedial works and/or mitigation necessary to address the risks posed by past coal mining activity.

It is noted that the discharge of condition submission is supported by a Rotary Borehole Site Investigation Report, dated February 2023 produced by GeoInvestigate, reference G22352. The report authors state that 2 boreholes have been drilled on site to depths of up to 30m to investigate if shallow coal workings are present beneath the site.

The report authors note that evidence of a shallow coal seam was encountered during these investigations, although comments that it is highly weathered in the locality. Further to this, no broken ground or voids were recorded during drilling works and based on these findings the report concludes that the risk to the site from shallow mining is low. As such, the report goes on to comment that no mitigation or remedial measures are required for the development, in relation to the historical coal mining legacy of the site.

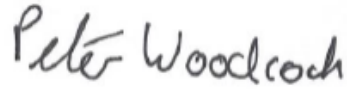
Whilst we note the conclusions of the submitted report, we must highlight that the Coal Authority records indicate that the Millgrit and Rag coal seams have both been worked at shallow depth beneath the site with extraction thicknesses of 200cm and 150cm respectively. This matter is not addressed in the report.

Until the discrepancy between the results of the investigations and our records has been satisfactorily addressed, and confirmation provided that the recorded

workings pose no risk to the proposed development, the Coal Authority's Planning & Development Team is unable to recommend that the LPA should discharge Conditions 5 and 6 of the issued consent.

Please do not hesitate to contact me if you would like to discuss this matter further.

Yours sincerely,



Peter Woodcock | BSc (Hons)
Trainee Planning Manager

Disclaimer

The above consultation response is provided by The Coal Authority as a Statutory Consultee and is based upon the latest available data on the date of the response, and electronic consultation records held by The Coal Authority since 1 April 2013. The comments made are also based upon only the information provided to The Coal Authority by the Local Planning Authority and/or has been published on the Council's website for consultation purposes in relation to this specific planning application. The views and conclusions contained in this response may be subject to review and amendment by The Coal Authority if additional or new data/information (such as a revised Coal Mining Risk Assessment) is provided by the Local Planning Authority or the Applicant for consultation purposes.

In formulating this response The Coal Authority has taken full account of the professional conclusions reached by the competent person who has prepared the Coal Mining Risk Assessment or other similar report. In the event that any future claim for liability arises in relation to this development The Coal Authority will take full account of the views, conclusions and mitigation previously expressed by the professional advisers for this development in relation to ground conditions and the acceptability of development.